

YOU HAVE ✓ PREMIUM ACCESS

THE CHRONICLE OF HIGHER EDUCATION

NEWS OPINION ADVICE STORE JOBS DEAN ▼ RENEW
Individual Subscriber

SECTIONS

FEATURED: History's Attack Dog The 2018 Influence List Why We Need to Rethink Remediation

Search



COMMENTARY

Engineers Need the Liberal Arts, Too



Adam Niklewicz for The Chronicle

By Kenneth Osgood | MAY 21, 2017 ✓ PREMIUM

Donald Trump's failed plan to eliminate the National Endowment for the Humanities and the National Endowment for the Arts had its share of predictable opponents from higher education, with some unlikely allies: scientists and engineers, together with companies that hire them and the technical

universities that train them. This may seem surprising. After all, engineers and scientists don't make a habit of lobbying for literature. Many also pursue careers in big industries that seem squarely in Donald Trump's camp: oil, mining, and manufacturing chief among them. Why, then, would they possibly care about such fluff as history, philosophy, music, literature, or even, egads, poetry?

The agencies survived the Trump ax for now, but their time on the chopping block reveals how poorly many in Washington understand their value: Our vitality in the arts and humanities contributes directly to our national innovation edge, even in the technical world of science, technology, engineering, and math — the highly prized STEM fields. I hear it from employers all the time.

Recruiters regularly visit my campus in Golden, Colo. — the home of both Coors beer and my own Colorado School of Mines. Like those from other engineering and applied-sciences universities, our graduates are in high demand in such critical sectors as energy, aerospace, information technology, manufacturing, and construction. My students earn big starting salaries, and recruiters go to great lengths to woo our top graduates.

That's why, when hundreds of recruiters descend on my campus twice each year, I make a point of understanding their needs. I ask any I encounter the same thing: "What are you looking for from our graduates?" Without fail, I get a version of the same answer. Yes, they want technical skills. But they also want something broader. They want to hire engineers who can communicate and think critically, who can adapt and create, who can assess the quality of conflicting information, and who can view a problem from multiple perspectives. These are the core skills cultivated by the liberal arts, and I've never met an employer who didn't think they were more important than most other people think.

Indeed, recently I put my question to a senior executive of one of the country's biggest oil companies. "I'm looking for diversity of thought," he said, without hesitating. "When I put a team of engineers on a project, I don't want a bunch of people who all think the same. I need people who can see things differently, who can bring unique perspectives to the table, who can empathize with others, and think outside the box. To be innovative, we need that."

I didn't have to tell him that the arts and humanities are key to developing these perspectives. It's what a liberal-arts education does best. But science, art, engineering, and music also have much in common: They're all creative enterprises. Building proficiency in one area strengthens the others. Many top engineering colleges recognize this, and for years leading authorities have been calling for integrating the arts into the STEM curriculum. It's the move from STEM to "STEAM," and it's not so big a leap as it appears.

In this globalized era of rapid technological change, our knowledge in science and engineering doubles every 10 years, and the challenges facing humanity in energy, water, infrastructure, public health, and security will only grow in complexity and scale. Learning can't stop with a diploma. Nor can it stop at the water's edge. International markets and the global diffusion of technological capabilities, particularly in India and China, prompt engineers and scientists to work in teams made up of individuals from diverse cultural backgrounds.

Add to this the life-altering impact of technology on all aspects of society, and it's easy to discern that scientists and engineers can't simply crank out solutions from isolated cubicles. They need to be engaged in the world around them, and this requires a broad education.

Such has been a core recommendation of the National Academy of Engineering. In 2004, the academy looked at the grand challenges that lay ahead and predicted a new future for "The Engineer of 2020," one in which being grounded in the basics of math and science won't be enough. Engineers will need to "understand and appreciate history, philosophy, culture, and the arts, along with the creative elements of all of these disciplines."

Surprise of surprises, this means that, yes indeed, engineers will need "a solid grounding in the humanities, social sciences, and economics." Those of us who teach the liberal arts at STEM institutions have been making this claim for years. But now that we are, quite literally, educating the engineers of 2020, and now that political leaders are evincing ever more skepticism about the humanities and the arts, the need for articulating the importance of these fields has renewed urgency.

In the world of STEM, as in the world writ large, the arts and humanities are critical: not just for developing marketable skills, but for understanding the world around us, including the role of science and technology in our everyday lives. That's why even at places like the Colorado School of Mines, where we offer more than a dozen undergraduate degrees, all of them in applied science and engineering, we also have an entire division of the faculty who teach in the humanities, arts, and social sciences. It's one of our biggest academic departments. And here's a bonus: Our faculty are the least expensive. Historians and philosophers don't cost much.

They also don't get much financial support. Yet over the years, grants from the National Endowment for the Humanities have supported research and professional development for our faculty in such areas as ethics in engineering, the lessons of Hurricane Katrina, the role of Darwinian evolution in society, and the often contentious relationships between extractive industries and communities.

Forty years ago, the NEH also provided the seed money that launched our McBride Honors Program, which I now direct. The program integrates the arts and sciences throughout an intensive curriculum. It counts among its graduates many dozens of leaders and entrepreneurs across a wide array of fields. Now that it's off the ground, our program is largely self-supporting. Donors who have gone on to success in engineering industries, including oil and mining, regularly provide funding because they recognize that a broad education is critical to innovation, leadership, and success.

Add it all up, and we see that support for the arts and humanities isn't a boondoggle lining the pockets of pie-in-the-sky liberal academics. It's one of many critical investments we make in innovation that reaps big rewards, however hard they may be to calculate. You don't need to be an artist or a poet to see that.

Kenneth Osgood is a professor of history and director of the McBride Honors Program at Colorado School of Mines.

A version of this article appeared in the May 26, 2017 issue.

1255 Twenty-Third St., N.W.
Washington, D.C. 20037

Copyright © 2018 The Chronicle of Higher Education

